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TEST RESULTS OF GRADATION FOR WMM

Lab ID	:	**CP-RW-2017-07-13-01** **Date: 15-07-17**
Customer	:	Assistant Executive Engineer, Yelahanka Satellite Town Sub Division, BBMP, Bangalore.
Address	:	Yelahanka Satellite Town Sub Division, BBMP, Bangalore.
Project Name	:	Improvements and Asphalting of Roads and Drains at Attur Layout in Ward No.03 (Balance Roads)
Agency	:	Technical Manager (west), KRIDL, BBMP, Bangalore.
Customer Reference	:	BBMP/EE(YNK.D)/W.O/69/2017-18
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	13-07-17
Sample ID No	:	2017-07-13-01/01
Type of Mix	:	WMM (Wet Mix Macadam)
Date of test	:	13-07-17
Oven Dry Weight	:	11200 Grams

IS Sieve Size(mm)	Weight Retained (gm)	Cumulative Weight Retained (gm)	% Cumulative Weight Retained	% Passing	Spec.I.Vide Table 400.13 MORTH Specification
53	0	0	0.0	100.0	100
45	335	335	3.0	97.0	95-100
22.4	2259	2594	23.2	76.8	60-80
11.2	2279	4873	43.5	56.5	40-60
4.75	2251	7124	63.6	36.4	25-40
2.36	1621	8745	78.1	21.9	15-30
0.6	623	9368	83.6	16.4	8-22
0.075	1338	10706	95.6	4.4	0-5

Note:-

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TEST REPORT OF AGGEGRATE IMPACT VALUE
IS: 2386 Part IV

Lab ID	:	**CP-RW-2017-07-13-01** **Date: 15-07-17**
Customer	:	Assistant Executive Engineer, Yelahanka Satellite Town Sub Division, BBMP, Bangalore.
Address	:	Yelahanka Satellite Town Sub Division, BBMP, Bangalore.
Project Name	:	Improvements and Asphalting of Roads and Drains at Attur Layout in Ward No.03 (Balance Roads)
Agency	:	Technical Manager (west), KRIDL, BBMP, Bangalore.
Customer Reference	:	BBMP/EE(YNK.D)/W.O/69/2017-18
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	13-07-17
Sample ID No	:	2017-07-13-01/01
Type of Mix	:	Coarse Aggregate for WMM (Wet Mix Macadam)
Date of test	:	13-07-17

Sl.No	Particulars of observations	Index	TEST 1	TEST 2
1	Total weight of the surface dry sample sample (passing 12.5 mm and retained on 10mm sieve)	A	300.2	300.2
2	Weight of fraction passing 2.36mm sieve After giving 15 blows	B	73.8	74.0
3	weight of fraction retained 2.36mm sieve After giving 15 blows	C	225.5	225.7
4	Total weight of (B+C) is less than the initial weight (Weight A) by more than one gram the result shall be discarded and a fresh test made.	A-(B+C)	0.9	0.5
5	Aggregate impact value	(B/A)*100	24.6	24.7
6	Aggregate impact value (Mean of two tests)	Pecentage	24.6	

Note:-

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DETERMINATION OF FLAKINESS INDEX AND ELONGATION INDEX OF COARSE AGGREGATE(IS 2386 (Part 1) 1963 (RA 2007)

Lab ID	:	**CP-RW-2017-07-13-01**	**Date: 15-07-17**
Customer	:	Assistant Executive Engineer, Yelahanka Satellite Town Sub Division, BBMP, Bangalore.	
Address	:	Yelahanka Satellite Town Sub Division, BBMP, Bangalore.	
Project Name	:	Improvements and Asphalting of Roads and Drains at Attur Layout in Ward No.03 (Balance Roads)	
Agency	:	Technical Manager (west), KRIDL, BBMP, Bangalore.	
Customer Reference	:	BBMP/EE(YNK.D)/W.O/69/2017-18	
Source of Sample	:	Sample supplied by Agency	
Sample Condition	:	Satisfactory	
Date of Receipt	:	13-07-17	
Sample ID No	:	2017-07-13-01/01	
Type of Mix	:	Coarse Aggregate for WMM (Wet Mix Macadam)	
Date of test	:	13-07-17	

Result:

Index	Percentage of Flakiness and Elongation Index	Secified limits as per MORTH specification table 400-12
Flakiness Index	11.8%	Combined Flakiness & Elongation Index for WMM is Maximum 35%
Elongation Index	11.2%	
Combined Flakiness and Elongation Index for WMM	23.0%	

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TEST RESULTS OF GRADATION FOR DBM
(IS 2386:(Part 1) 1963 (RA2011)

Lab ID	:	**CP-RW-2017-07-19-01** **Date: 21-07-17**
Customer	:	Assistant Executive Engineer, Yelahanka Satellite Town Sub Division, BBMP, Bangalore.
Address	:	Yelahanka Satellite Town Sub Division, BBMP, Bangalore.
Project Name	:	Improvements and Asphalting of Roads and Drains at Attur Layout in Ward No.03 (Balance Roads)
Agency	:	Technical Manager (west), KRIDL, BBMP, Bangalore.
Customer Reference	:	BBMP/EE(YNK.D)/W.O/69/2017-18
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	19-07-17
Sample ID No	:	2017-07-19-01/01
Type of Mix	:	DBM-Plant (Dense Bituminous Macadam)
Date of test	:	19-07-17
Weight of Sample	:	Y6 Grams

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Specification Limits as per MORTH specification Table 500-10 (grading -2)
37.5	0	0	#VALUE!	#VALUE!	100
26.5	172	172	#VALUE!	#VALUE!	90-100
19	1013	1185	#VALUE!	#VALUE!	71-95
13.2	520	1705	#VALUE!	#VALUE!	56-80
4.75	1150	2855	#VALUE!	#VALUE!	38-54
2.36	690	3545	#VALUE!	#VALUE!	28-42
0.3	1094	4639	#VALUE!	#VALUE!	7-21
0.075	292	4931	#VALUE!	#VALUE!	2-8
PAN	69	5000	0.00	0	0

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PHYSICAL REQUIREMENTS FOR COARSE AGGREGATE FOR DENSE BITUMINOUS MACADAM

Lab ID	:	**CP-RW-2017-07-19-01** **Date: 22-07-17**
Customer	:	Assistant Executive Engineer, Yelahanka Satellite Town Sub Division, BBMP, Bangalore.
Address	:	Yelahanka Satellite Town Sub Division, BBMP, Bangalore.
Project Name	:	Improvements and Asphalting of Roads and Drains at Attur Layout in Ward No.03 (Balance Roads)
Agency	:	Technical Manager (west), KRIDL, BBMP, Bangalore.
Customer Reference	:	BBMP/EE(YNK.D)/W.O/69/2017-18
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	19-07-17
Sample ID No	:	2017-07-19-01/01
Type of Mix	:	DBM (Dense Bituminous Macadam)
Date of test	:	19-07-17

Table 500-6 : Physical Requirements fo Coarse Aggregate for Dense Bituminous Macadam

Property	Test	Result	Specification	Method of Test
Partical Shape	Flakiness Index	13.4	Combined Flakiness & Elongation Index for DBM is Maximum 35%	IS:2386 Part I
	Elongation Index	12.6		
Strength	Aggregate Impact Value	24.5	Maximum 30%	IS:2386 Part IV
Specific gravity	Specific gravity	2.69	Maximum 2.7	IS:2386 Part III
Water Absorption	Water Absorption	0.23	Maximum 2%	IS:2386 Part III

Note:
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TEST REPORT OF AGGEGRATE STRIPPING VALUE OF ROAD AGGRGATE (IS:6241)

Lab ID	:	**CP-RW-2017-07-19-01** **Date: 22-07-17**
Customer	:	Assistant Executive Engineer, Yelahanka Satellite Town Sub Division, BBMP, Bangalore.
Address	:	Yelahanka Satellite Town Sub Division, BBMP, Bangalore.
Project Name	:	Improvements and Asphalting of Roads and Drains at Attur Layout in Ward No.03 (Balance Roads)
Agency	:	Technical Manager (west), KRIDL, BBMP, Bangalore.
Customer Reference	:	BBMP/EE(YNK.D)/W.O/69/2017-18
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	19-07-17
Sample ID No	:	2017-07-19-01/01
Type of Mix	:	DBM(Dense Bitumnous Macadam)
Date of test	:	19-07-17

Type of Binder	:	60/70
% of Binder Used	:	5.0%
Weight of Aggregate	:	200.0 gm
Weight of Binder	:	10.0 gm
Temperature of water bath	:	40°C

No of test	Retained Stripping Percentage	Stripping Percentage	Average Retained Stripping Percentage	Secified limits as per MORTH specification table 500-8
1	98.0	2.0	98.2	Minimum Retained Coating 95%
2	98.5	1.5		
3	98.0	2.0		

Note:
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TESTS RESULTS ON STABILITY OF MIX

Lab ID	:	**CP-RW-2017-07-19-01** **Date: 22-07-17**
Customer	:	Assistant Executive Engineer, Yelahanka Satellite Town Sub Division, BBMP, Bangalore.
Address	:	Yelahanka Satellite Town Sub Division, BBMP, Bangalore.
Project Name	:	Improvements and Asphalting of Roads and Drains at Attur Layout in Ward No.03 (Balance Roads)
Agency	:	Technical Manager (west), KRIDL, BBMP, Bangalore.
Customer Reference	:	BBMP/EE(YNK.D)/W.O/69/2017-18
Source of Sample	:	Hot Mix Plant, Bangalore
Sample Condition	:	Satisfactory
Date of Receipt	:	19-07-17
Sample ID No	:	2017-07-19-01/01
Type of Mix	:	DBM (Dense Bituminous Mecadam)
Date of test	:	19-07-17

The results of the tests conducted on the Dense Bituminous Macadam mix sample are as follow

SLNo	Particulars of observations	TEST 1	TEST 2	Secified limits as per MORTH specification table 500-11
1	Marshal Stability at 60°C, KN	11.59	11.42	9KN(Min)
2	Marshal flow at 60°C, mm	3.54	3.87	2-4
3	Percent air Voids	4.56	4.17	3-5
4	Percent Voids in mineral Aggregate(VMA %)	14.54	14.76	13-15
5	Percent Voids filled with Bitumen(VFB %)	68.98	70.28	65-75
6	Density, g/cc	2.42	2.40	–

Note:-
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LC —— 1/

TEST RESULTS OF GRADATION FOR DBM
(IS 2386:(Part 1) 1963 (RA2011)

Lab ID	:	**CP-RW-2017-08-23-01** **Date: 24-08-17**
Customer	:	Assistant Executive Engineer, Yelahanka Satellite Town Sub Division, BBMP, Bangalore.
Address	:	Yelahanka Satellite Town Sub Division, BBMP, Bangalore.
Project Name	:	Improvements and Asphalting of Roads and Drains at Attur Layout in Ward No.03 (Balance Roads)
Agency	:	Technical Manager (west), KRIDL, BBMP, Bangalore.
Customer Reference	:	BBMP/EE(YNK.D)/W.O/69/2017-18
Source of Sample	:	Sample supplied by Agency
Date of Receipt	:	23-08-17
Sample ID No	:	2017-08-23-01/01
Type of Mix	:	DBM (Dense Bituminous Macadam)
Date of test	:	23-08-17

Sl.no	Description	Index	Trail 1	Trail 2
1	Weight of the Sample	A	500	500
2	Weight of the sample After extraction	B	479	477
3	Bitumen percentage	$\frac{A-B}{A} \times 100$	4.2	4.6
4	Average percentage	%	4.4	

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Lab ID : CP-RW-2017-08-23-01
Sample ID No : 2017-08-23-01/01
Date: 24-08-17

AFTER EXTRACTION(Trail-1)

Weight of Sample(gm) : 479

IS Sieve Size(mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Specification Limits as per MORTH specification Table 500-10(grading -2)
37.5	0	0	0	100.0	100
26.5	3	3	0.63	99.4	90-100
19	47	50	10.44	89.6	71-95
13.2	46.5	96.5	20.15	79.9	56-80
4.75	134	230.5	48.12	51.9	38-54
2.36	60	290.5	60.65	39.4	28-42
0.3	95	385.5	80.48	19.5	7-21
0.075	65	450.5	94.05	5.9	2-8

AFTER EXTRACTION(Trail-2)

Weight of Sample(gm) : 477

IS Sieve Size(mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Specification Limits as per MORTH specification Table 500-10(grading -2)
37.5	0	0	0	100.0	100
26.5	4	4	0.84	99.2	90-100
19	75	79	16.56	83.4	71-95
13.2	136	215	45.07	54.9	56-80
4.75	75	290	60.80	39.2	38-54
2.36	45	335	70.23	29.8	28-42
0.3	63	398	83.44	16.6	7-21
0.075	50	448	93.92	6.1	2-8

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TEST RESULTS OF GRADATION FOR BC
IS 2386 (Part 1) 1963 (RA 2007)

Lab ID	:	**CP-RW-2017-07-26-03** **Date: 28-07-17**
Customer	:	Assistant Executive Engineer, Yelahanka Satellite Town Sub Division, BBMP, Bangalore.
Address	:	Yelahanka Satellite Town Sub Division, BBMP, Bangalore.
Project Name	:	Improvements and Asphalting of Roads and Drains at Attur Layout in Ward No.03 (Balance Roads)
Agency	:	Technical Manager (west), KRIDL, BBMP, Bangalore.
Customer Reference	:	BBMP/EE(YNK.D)/W.O/69/2017-18
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	26-07-17
Sample ID No	:	2017-07-26-03/01
Type of Mix	:	BC-Plant (Bituminous Concrete)
Date of test	:	26-07-17
Oven Dry Weight	:	5000 Grams

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Secified limits as per MORTH specification table 500-17(grading-2)
19	0	0	0.0	100.0	100
13.2	90	90	1.8	98.2	90-100
9.5	700	790	15.8	84.2	70-88
4.75	890	1680	33.6	66.4	53-71
2.36	592	2272	45.4	54.6	42-58
1.18	496	2768	55.4	44.6	34-48
0.6	508	3276	65.5	34.5	26-38
0.3	532	3808	76.2	23.8	18-28
0.15	465	4273	85.5	14.5	12-20
0.075	350	4623	92.5	7.5	4-10
PAN	377	5000	100	0.0	0

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PHYSICAL REQUIREMENTS FOR COARSE AGGREGATE FOR BITUMINOUS CONCRETE

Lab ID	:	**CP-RW-2017-07-26-03** **Date: 29-07-17**
Customer	:	Assistant Executive Engineer, Yelahanka Satellite Town Sub Division, BBMP, Bangalore.
Address	:	Yelahanka Satellite Town Sub Division, BBMP, Bangalore.
Project Name	:	Improvements and Asphalting of Roads and Drains at Attur Layout in Ward No.03 (Balance Roads)
Agency	:	Technical Manager (west), KRIDL, BBMP, Bangalore.
Customer Reference	:	BBMP/EE(YNK.D)/W.O/69/2017-18
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	26-07-17
Sample ID No	:	2017-07-26-03/01
Type of Mix	:	BC (Bituminous Concrete)
Date of test	:	26-07-17

Table 500-16 : Physical Requirements fo Coarse Aggregate for Bituminous Concrete

Property	Test	Result	Specification	Method of Test
Partical Shape	Flakiness Index	11.5	Combined Flakiness & Elongation Index for BC is Maximum 35%	IS:2386 Part I
	Elongation Index	11.1		
Strength	Aggregate Impact Value	22.9	Maximum 24%	IS:2386 Part IV
Specific gravity	Specific gravity	2.69	Maximum 2.7	IS:2386 Part III
Water Absorption	Water Absorption	0.24	Maximum 2%	IS:2386 Part III

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TEST REPORT OF AGGEGRATE STRIPPING VALUE OF ROAD AGGRGATE (IS:6241)

Lab ID	:	**CP-RW-2017-07-26-03** **Date: 29-07-17**
Customer	:	Assistant Executive Engineer, Yelahanka Satellite Town Sub Division, BBMP, Bangalore.
Address	:	Yelahanka Satellite Town Sub Division, BBMP, Bangalore.
Project Name	:	Improvements and Asphalting of Roads and Drains at Attur Layout in Ward No.03 (Balance Roads)
Agency	:	Technical Manager (west), KRIDL, BBMP, Bangalore.
Customer Reference	:	BBMP/EE(YNK.D)/W.O/69/2017-18
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	26-07-17
Sample ID No	:	2017-07-26-03/01
Type of Mix	:	BC(Bitumenous Concrete)
Date of test	:	26-07-17

Type of Binder	:	60/70
% of Binder Used	:	5.0%
Weight of Aggregate	:	200.0 gm
Weight of Binder	:	10.0 gm
Temperature of water bath	:	40°C

No of test	Retained Stripping Percentage	Stripping Percentage	Average Retained Stripping Percentage	Secified limits as per MORTH specification table 500-8
1	97.5	2.5	97.8	Minimum Retained Coating 95%
2	98.5	1.5		
3	97.5	2.5		

Note:
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4, 7TH MAIN MALLESWARAM, BANGALORE -3

TESTS RESULTS ON STABILITY OF MIX

Lab ID	:	**CP-RW-2017-07-26-03** **Date: 29-07-17**
Customer	:	Assistant Executive Engineer, Yelahanka Satellite Town Sub Division, BBMP, Bangalore.
Address	:	Yelahanka Satellite Town Sub Division, BBMP, Bangalore.
Project Name	:	Improvements and Asphalting of Roads and Drains at Attur Layout in Ward No.03 (Balance Roads)
Agency	:	Technical Manager (west), KRIDL, BBMP, Bangalore.
Customer Reference	:	BBMP/EE(YNK.D)/W.O/69/2017-18
Source of Sample	:	Hot Mix Plant, Bangalore
Sample Condition	:	Satisfactory
Date of Receipt	:	26-07-17
Sample ID No	:	2017-07-26-03/01
Type of Mix	:	BC (Bituminous Concrete)
Date of test	:	26-07-17

The results of the tests conducted on the Bituminous Concrete mix sample are as follow

Sl.No	Particulars of observations	TEST 1	TEST 2	Secified limits as per MORTH specification table 500-11
1	Marshal Stability at 60°C, KN	11.25	11.3	10KN(min)
2	Marshal flow at 60°C, mm	3.58	3.55	2-4
3	Percent air Voids	4.82	4.83	3-5
4	Percent Voids in mineral Aggregate(VMA %)	14.27	14.26	13-15
5	Percent Voids filled with Bitumen(VFB %)	71.9	71.63	65-75
6	Density, g/cc	2.24	2.26	–

Note:-
The results pertain to the samples received and tested.
All information furnished by Customer/Representative
Any correction in the report will make this report invalid.
This report without prior written approval should not be reproduced or published in full or part.
Samples will be disposed after 30 days from the date of issue of test certificate

AE W3

AE-03

CIVIL PRO Sig Date BANGALORE

FOR CIVIL Pro

R KARTHIK RECHAN
Authorized Signatory
Quality Manager

End of Report

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HIGHWAY & BUILDING MATERIALS TESTING LABORATORY | STRUCTURAL| GEO TECHNICAL| PROJECT MANAGEMENT| SURVEYING SERVICES |

TEST RESULTS OF GRADATION FOR BC
IS 2386 (Part 1) 1963 (RA 2011)

Lab ID	:	**CP-RW-2017-08-25-01** **Date: 26-08-17**
Customer	:	Assistant Executive Engineer, Yelahanka Satellite Town Sub Division, BBMP, Bangalore.
Address	:	Yelahanka Satellite Town Sub Division, BBMP, Bangalore.
Project Name	:	Improvements and Asphalting of Roads and Drains at Attur Layout in Ward No.03 (Balance Roads)
Agency	:	Technical Manager (west), KRIDL, BBMP, Bangalore.
Customer Reference	:	BBMP/EE(YNK.D)/W.O/69/2017-18
Source of Sample	:	Sample supplied by Agency
Date of Receipt	:	25-08-17
Sample ID No	:	2017-08-25-01/01
Type of Mix	:	BC (Bituminous Concrete)
Date of test	:	25-08-17

SLno	Description	Index	Trail 1	Trail 2
1	Weight of the Sample	A	500	501
2	Weight of the sample After extraction	B	473	474
3	Bitumen percentage	$\frac{A-B}{A} \times 100$	5.40	5.39
4	Average percentage	%	5.4	

AE W3

AE-02

CIVIL Pro Sig Date BANGALORE

FOR CIVIL Pro.

R KARTHIK RECHAN
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LC —— 1/

Lab ID : CP-RW-2017-08-25-01 **Date: 26-08-17**

Sample ID : 2017-08-25-01/01

AFTER EXTRACTION - Trail-1

Total Weight of the Sample(gm) : 473

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Secified limits as per MORTH specification table 500-23(grading-2)
19	0	0	0.0	100.0	100
13.2	4	4	0.8	99.2	90-100
9.5	62	66	14.0	86.0	70-88
4.75	112	178	37.6	62.4	53-71
2.36	88	266	56.2	43.8	42-58
1.18	29	295	62.4	37.6	34-48
0.6	11	306	64.7	35.3	26-38
0.3	46	352	74.4	25.6	18-28
0.15	45	397	83.9	16.1	12-20
0.075	55	452	95.6	4.4	4-10

AFTER EXTRACTION - Trail-2

Total Weight of the Sample(gm) : 474

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Secified limits as per MORTH specification table 500-23(grading-2)
19	0	0	0.0	100.0	100
13.2	4	4	0.8	99.2	90-100
9.5	76	80	16.9	83.1	70-88
4.75	112	192	40.5	59.5	53-71
2.36	78	270	57.0	43.0	42-58
1.18	31	301	63.5	36.5	34-48
0.6	9	310	65.4	34.6	26-38
0.3	45	355	74.9	25.1	18-28
0.15	48	403	85.0	15.0	12-20
0.075	32	435	91.8	8.2	4-10

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AE W3

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